

WHAT IS CLAIMED IS:

1. A food waste disposer comprising:

an upper food conveying section including a housing forming an inlet to receive food waste;

a motor section including a switched reluctance machine having a rotor and a stator, the rotor imparting rotational movement to a rotatable shaft;

a central grinding section disposed between the food conveying section and the motor section, the food conveying section conveying food waste to the grinding section, the grinding section including a grinding mechanism, a portion of the grinding mechanism mounted to the rotatable shaft;

a controller electrically connected to the stator to control the switched reluctance machine, the controller capable of directing rotational movement to the rotatable shaft and the portion of the grinding mechanism mounted to the rotatable shaft, the controller capable of maintaining the rotational movement at more than one rotating speed.

2. The food waste disposer of Claim 1, wherein the grinding mechanism includes a shredder plate assembly and a stationary shredder ring, the portion of the grinding mechanism mounted to the rotatable shaft being the shredder plate assembly.

3. The food waste disposer of Claim 2, wherein the shredder plate assembly includes fixed grinding lugs.

4. A food waste disposer comprising:

an upper food conveying section including a housing forming an inlet to receive food waste;

a motor section including a variable speed motor having a rotor and a stator, the rotor imparting rotational movement to a rotatable shaft;

a central grinding section disposed between the food conveying section and the motor section, the food conveying section conveying food waste to the grinding section,

the grinding section including a grinding mechanism, a portion of the grinding mechanism mounted to the rotatable shaft;

a controller electrically connected to the stator to control the variable speed motor, the controller capable of activating the variable speed motor at startup to rotate the portion of the grinding mechanism mounted to the rotatable shaft and slowly increasing the rotational speed of the portion of the grinding mechanism mounted to the rotatable shaft to a predetermined rotational rate over a predetermined period of time.

5. A food waste disposer comprising:

an upper food conveying section including a housing forming an inlet to receive food waste;

a motor section including a variable speed motor having a rotor and a stator, the rotor imparting rotational movement to a rotatable shaft;

a central grinding section disposed between the food conveying section and the motor section, the food conveying section conveying food waste to the grinding section, the grinding section including a grinding mechanism, a portion of the grinding mechanism mounted to the rotatable shaft;

a controller electrically connected to the stator to control the variable speed motor, the controller capable of rotating the portion of the grinding mechanism mounted to the rotatable shaft at a first rotational speed during a first period of time and rotating the portion of the grinding mechanism mounted to the rotatable shaft at a second rotational speed during a second period of time, the second rotational speed being less than the first rotational speed.

6. A food waste disposer comprising:

an upper food conveying section including a housing forming an inlet to receive food waste;

a motor section including a variable speed motor having a rotor and a stator, the rotor imparting rotational movement to a rotatable shaft;

a central grinding section disposed between the food conveying section and the motor section, the food conveying section conveying food waste to the grinding section, the grinding section including a grinding mechanism, a portion of the grinding mechanism mounted to the rotatable shaft;

5 a controller electrically connected to the stator to control the variable speed motor, the controller capable of rotating the portion of the grinding mechanism mounted to the rotatable shaft at a first rotational speed, the controller capable of determining whether food waste has entered the food waste disposer, the controller capable of increasing the first rotational speed to a second rotational speed if food waste has entered the food waste
10 disposer.

7. A food waste disposer comprising:

an upper food conveying section including a housing forming an inlet to receive food waste, the upper food conveying section having a water inlet to receive water;

15 a motor section including a variable speed motor having a rotor and a stator, the rotor imparting rotational movement to a rotatable shaft;

a central grinding section disposed between the food conveying section and the motor section, the food conveying section conveying food waste to the grinding section, the grinding section including a grinding mechanism, a portion of the grinding
20 mechanism mounted to the rotatable shaft;

a controller electrically connected to the stator to control the variable speed motor, the controller capable of rotating the portion of the grinding mechanism mounted to the rotatable shaft at a first rotational speed, the controller capable of increasing the first rotational speed to a second rotational speed during a period of time when water is
25 received through the water inlet, the second rotational speed greater than the first rotational speed.

8. A food waste disposer comprising:

an upper food conveying section including a housing forming an inlet to receive
30 food waste;

a motor section including a variable speed motor having a rotor and a stator, the rotor imparting rotational movement to a rotatable shaft;

a central grinding section disposed between the food conveying section and the motor section, the food conveying section conveying food waste to the grinding section, the grinding section including a grinding mechanism, a portion of the grinding mechanism mounted to the rotatable shaft;

a controller electrically connected to the stator to control the variable speed motor, the controller capable of rotating the portion of the grinding mechanism mounted to the rotatable shaft at a first rotational speed and a first torque, the controller capable of determining whether food waste is jammed in the grinding mechanism by monitoring a current provided to the variable speed motor, the controller capable of increasing the first torque to a second torque if it is determined that food waste is jammed in the grinding mechanism.

9. A method for reducing a slug of food waste into a drainpipe by a food waste disposer, the food waste disposer having a variable speed motor, a rotatable shaft and a grinding mechanism, the variable speed motor imparting rotational movement to the rotatable shaft, a portion of the grinding mechanism mounted to the rotatable shaft, the method comprising the steps of:

activating the variable speed motor at startup to rotate the portion of the grinding mechanism mounted to the rotatable shaft; and

slowly increasing the rotational speed of the portion of the grinding mechanism mounted to the rotatable shaft to a predetermined rotational rate over a predetermined period of time.

10. The method of Claim 9, wherein the grinding mechanism includes a shredder plate assembly and a stationary shredder ring, the portion of the grinding mechanism mounted to the rotatable shaft is the shredder plate assembly.

11. The method of Claim 10, wherein the shredder plate assembly includes fixed grinding lugs.

12. The method of Claim 9, wherein the predetermined rotational rate is greater than
5 1500 rotations per minute.

13. The method of Claim 9, wherein the predetermined period of time is greater than three (3) seconds.

10 14. The method of Claim 9, wherein the variable speed motor is a switched reluctance machine.

15 15. A method of operating a food waste disposer, the food waste disposer having a variable speed motor, a rotatable shaft and a grinding mechanism, the variable speed motor imparting rotational movement to the rotatable shaft, a portion of the grinding mechanism mounted to the rotatable shaft, the method comprising the steps of:

rotating the portion of the grinding mechanism mounted to the rotatable shaft at a first rotational speed during a first period of time; and

20 rotating the portion of the grinding mechanism mounted to the rotatable shaft at a second rotational speed during a second period of time, the second rotational speed being less than the first rotational speed.

25 16. The method of Claim 15, wherein the grinding mechanism includes a shredder plate assembly and a stationary shredder ring, the portion of the grinding mechanism mounted to the rotatable shaft is the shredder plate assembly.

17. The method of Claim 16, wherein the shredder plate assembly includes fixed grinding lugs.

18. The method of Claim 15, wherein the second period of time is after the first period of time.

19. The method of Claim 15, wherein the first rotational speed is between 2500 and 4000 rotations per minute.

20. The method of Claim 15, wherein the second rotational speed is less than 2500 rotations per minute.

21. The method of Claim 15, wherein the method further comprises the step of:
rotating the portion of the grinding mechanism mounted to the rotatable shaft at a third rotational speed during a third period of time, the third rotational speed being less than the second rotational speed.

22. The method of Claim 21, wherein the third rotational speed is between 100 and 1500 rotations per minute.

23. The method of Claim 15, wherein the variable speed motor is a switched reluctance machine.

24. A method of operating a food waste disposer, the food waste disposer having a variable speed motor, a rotatable shaft and a grinding mechanism, the variable speed motor imparting rotational movement to the rotatable shaft, a portion of the grinding mechanism mounted to the rotatable shaft, the method comprising the steps of:

rotating the portion of the grinding mechanism mounted to the rotatable shaft at a first rotational speed;

determining whether food waste has entered the food waste disposer; and

increasing the first rotational speed to a second rotational speed if food waste has entered the food waste disposer.

25. The method of Claim 24, wherein the grinding mechanism includes a shredder plate assembly and a stationary shredder ring, the portion of the grinding mechanism mounted to the rotatable shaft is the shredder plate assembly.

5 26. The method of Claim 25, wherein the shredder plate assembly includes fixed grinding lugs.

27. The method of Claim 24, wherein the first rotational speed is between 400 and 800 rotations per minute.

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28. The method of Claim 24, wherein the method further comprises the steps of:
determining whether food waste has exited the food waste disposer after
increasing the first rotational speed to a second rotational speed; and
decreasing the second rotational speed to the first rotational speed if food waste
15 has exited the food waste disposer.

29. The method of Claim 24, wherein the variable speed motor is a switched reluctance machine.

20 30. A method of operating a food waste disposer, the food waste disposer having a variable speed motor, a rotatable shaft, and a grinding mechanism, the variable speed motor imparting rotational movement to the rotatable shaft, a portion of the grinding mechanism mounted to the rotatable shaft, the method comprising the steps of:

rotating the portion of the grinding mechanism mounted to the rotatable shaft at a
25 first rotational speed;

entering water into the food waste disposer; and

increasing the first rotational speed to a second rotational speed during the
entering of water into the food waste disposer, the second rotational speed greater than
the first rotational speed.

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31. The method of Claim 30, wherein the grinding mechanism includes a shredder plate assembly and a stationary shredder ring, the portion of the grinding mechanism mounted to the rotatable shaft is the shredder plate assembly.

5 32. The method of Claim 31, wherein the shredder plate assembly includes fixed grinding lugs.

33. The method of Claim 30, wherein the first rotational speed is between 400 and 800 rotations per minute.

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34. The method of Claim 30, wherein the second rotational speed is greater than 1500 rotations per minute.

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35. The method of Claim 30, wherein the variable speed motor is a switched reluctance machine.

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36. A method of operating a food waste disposer, the food waste disposer having a variable speed motor, a rotatable shaft and a grinding mechanism, the variable speed motor imparting rotational movement to the rotatable shaft, a portion of the grinding mechanism mounted to the rotatable shaft, the method comprising the steps of:

rotating the portion of the grinding mechanism mounted to the rotatable shaft at a first rotational speed and a first torque;

determining whether food waste is jammed in the grinding mechanism by monitoring a current provided to the variable speed motor; and

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increasing the first torque to a second torque if it determined that food waste is jammed in the grinding mechanism.

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37. The method of Claim 36, wherein the grinding mechanism includes a shredder plate assembly and a stationary shredder ring, the portion of the grinding mechanism mounted to the rotatable shaft is the shredder plate assembly.

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38. The method of Claim 37, wherein the shredder plate assembly includes fixed grinding lugs.

5 39. The method of Claim 36, wherein the method further comprises the steps of:
stopping the rotation of the portion of the grinding mechanism mounted to the rotatable shaft; and
rotating the portion of the grinding mechanism mounted to the rotatable shaft in an opposite direction when it has been determined that a jam has occurred.

10 40. The method of Claim 36, wherein the method further comprises the steps of:
stopping the rotation of the portion of the grinding mechanism mounted to the rotatable shaft; and
performing a series of quick backward and forward rotations when it has been
15 determined that a jam has occurred.

41. The method of Claim 36, wherein the variable speed motor is a switched reluctance machine.

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